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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/807,873 | 03/23/2004 | James W. Stasiak | 200309781 | 5513 |

22879 7590 05/14/2008
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| EXAMINER |
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TRAN, BINH X

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| ART UNIT | PAPER NUMBER |
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1792

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| NOTIFICATION DATE | DELIVERY MODE |
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05/14/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/807,873 | Applicant(s) STASIAK ET AL. | |
| | Examiner Binh X. Tran | Art Unit 1792 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05-07-2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26,27,31,32,38,41 and 73 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26,27,31,32 and 73 is/are rejected.
- 7) ☒ Claim(s) 38 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group II (claims 26-27, 31-32, 38, 41, 73) in the reply filed on 05-07-2008 is acknowledged.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: In page 6, lines 19-22, the applicants describe a resist layer 230 in Figure 2. However, the examiner is unable to find reference number 230 in Figure 2. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 26 objected to because of the following informalities: In line 10 of claim 26, the phrase "a group consisting of" is improper Markush language. The examiner

suggests replacing "a group consisting of" to --the group consisting of-- Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 26-27, 31-32, 41, 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guo et al. (US 2006/0237881 A1) in view of Yang et al. (US 2004/0071924 A1).

Respect to claim 26, Guo discloses a method of fabricating ordered nano-scale pattern on a substrate surface comprising:

applying resist layer (20) to a substrate surface (Fig 2a);

stamping an imprint mold (12) having nanoscale teeth (14) onto the resist (Fig 2b; paragraph 0042, Fig 5, paragraph 0050);

releasing the imprint mold (12) to expose a template having a template surface formed into the imprint resist layer (20) and having nanoscale openings (16) formed therein (Fig 2c, paragraph 0042, Fig 5, paragraph 50).

Guo fails to disclose the step of depositing a plurality of discrete nanoscale objects onto the template such that the nanoscale objects are received within said nanoscale openings, said nanoscale objects are selected from the group consisting of nanoparticles, nanowires, nanorods, nanotubes, proteins and DNA. Yang discloses to create a pattern having nanoscale opening using nano-imprint techniques (paragraph 0030, 0052, 0056). Yang discloses depositing a plurality of discrete nanoscale objects onto the template such that the nanoscale objects are received within said nanoscale openings, said nanoscale objects are nanoparticles (26) in order to create storage medium (abstract, paragraph 0015). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Guo in view of Yang by depositing a plurality of discrete nano particles onto the template such that the nanoscale objects are received within said nanoscale openings because it helps to create a pattern for the data storage medium.

Respect to claim 27, Guo discloses selectively removing residues layer material from the substrate surface to expose portions of the substrate surface (Fig 2).

Respect to claim 31, Yang discloses the step of removing the nanoscale object (26) that remains outside of the openings with a chemical wash (Fig 9e, paragraph

0067) in order to form a patterned of array nanoparticles (paragraph 0067). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Gou in view of Yang by using a chemical washing because it helps to remove access nanoparticles and create a patterned of array nanoparticles.

Respect to claim 32, Yang disclose the nanoscale openings are orders in pattern with respect to at least one of the group consisting of size, orientation, pattern and position (Fig 6-7). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Guo in view of Yang by ordering the nanoscale openings in pattern with respect to at least one of the group consisting of size, shape, orientation, pattern, and position because it helps to create ordered pattern for the data storage medium.

Respect to claim 41, Guo discloses the stamping process can be performed by step-and-flash imprint lithography (S-FIL; See paragraph 0056).

Respect to claim 73, Yang disclose the step of forming a first set of wires below the template and forming a second set of wires above the template, and wherein the nanoscale objects are conductive (metal material) and provide electrical connection between the first and second set of wires (See Fig 9c-9f). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Chou in view of Yang by providing electrical connection between first and second set of wires between this will create multi-layer structure for the recording media.

6. Claims 26-27, 31-32, 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chou (US 6,828,244) in view of Yang et al. (US 2004/0071924 A1).

Respect to claim 26, Chou discloses a method of fabricating ordered nano-scale pattern on a substrate surface comprising:

applying resist layer to a substrate surface (Fig 1);

stamping an imprint mold having nanoscale teeth onto the resist (20) (Fig 1, col. 3 lines 55-67);

releasing the imprint mold to expose a template having a template surface formed into the imprint resist layer and having nanoscale openings formed therein (fig 1).

Chou fails to disclose the step of depositing a plurality of discrete nanoscale objects onto the template such that the nanoscale objects are received within said nanoscale openings, said nanoscale objects are selected from the group consisting of nanoparticles, nanowires, nanorods, nanotubes, proteins and DNA. Yang discloses to create a pattern having nanoscale opening using nano-imprint techniques (paragraph 0030, 0052, 0056). Yang discloses depositing a plurality of discrete nanoscale objects onto the template such that the nanoscale objects are received within said nanoscale openings, said nanoscale objects are nanoparticles (26) in order to create storage medium (abstract, paragraph 0015). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Chou in view of Yang by depositing a plurality of discrete nano particles onto the template such that the nanoscale objects are received within said nanoscale openings because it helps to create a pattern for the data storage medium.

Respect to claim 27, Chou discloses selectively removing residues layer material from the substrate surface to expose portions of the substrate surface (Fig 1, col. 4 lines 18-35).

Respect to claim 31, Yang disclose the step of removing the nanoscale object (26) that remains outside of the openings with a chemical wash (Fig 9e, paragraph 0067) in order to form a patterned of array nanoparticles (paragraph 0067). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Chou in view of Yang by using a chemical washing because it helps to remove access nanoparticles and create a patterned of array nanoparticles.

Respect to claim 32, Yang disclose the nanoscale openings are orders in pattern with respect to at least one of the group consisting of size, orientation, pattern and position (Fig 6-7). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Chou in view of Yang by ordering the nanoscale openings in pattern with respect to at least one of the group consisting of size, shape, orientation, pattern, and position because it helps to create ordered pattern for the data storage medium.

Respect to claim 73, Yang disclose the step of forming a first set of wires below the template and forming a second set of wires above the template, and wherein the nanoscale objects are conductive (metal material) and provide electrical connection between the first and second set of wires (See Fig 9c-9f). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Chou in view of

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Yang by providing electrical connection between first and second set of wires between this will create multi-layer structure for the recording media.

7. Claim 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chou and Yang as applied to claim 26-27, 31-32, 73 above, and further in view of French et al. (US 2004/0038556 A1).

Respect to claim 41, Chou and Yang fail to disclose step-and-flash lithography process. However, Chou clearly discloses nano-imprint process. French discloses nano-imprint lithography includes step-and-flash (paragraph 0135; 0166). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Chou and Yang in view of French by using step-and-flash lithography because equivalent and substitution of one for another would produce an expected result.

Allowable Subject Matter

8. Claim 38 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten to overcome the claim objection set forth in this office action and in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: The cited prior arts fail to disclose or suggest the step of attaching DNA oligomers to the nanoscale objects and wherein the nanoscale objects are proteins.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X. Tran whose telephone number is (571)272-

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1469. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Binh X Tran
Primary Examiner
Art Unit 1792

/Binh X Tran/
Primary Examiner, Art Unit 1792